OPERATING MANUAL

MEGA 1000W

BALANCE CHARGER/DISCHARGER

For LiPo/LiFe/LiIon/NiMH/NiCd/Pb Batteries

TURNIGY®

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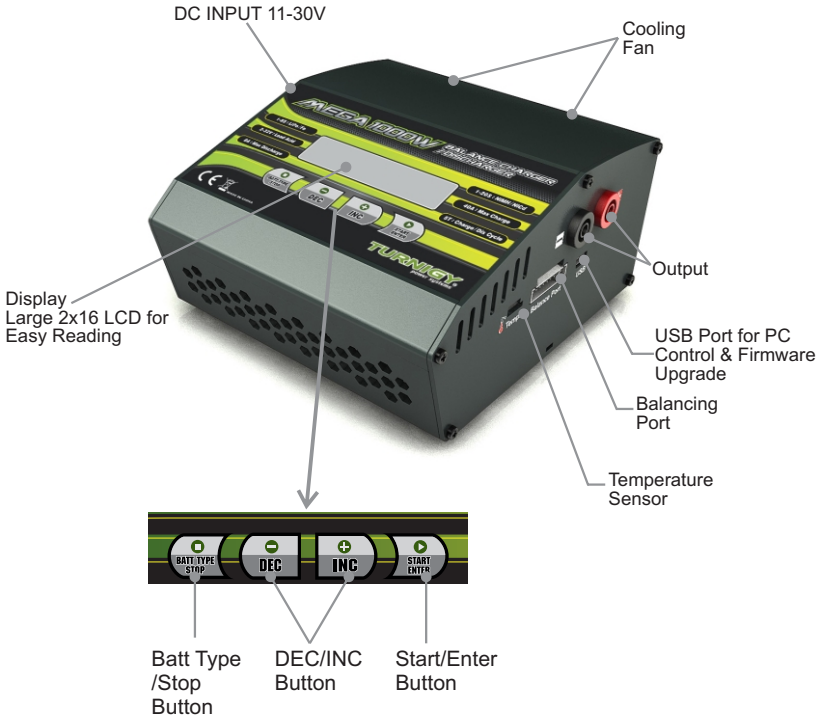
Congratulations on your choice of the Turnigy Mega 1000W digital intelligent charger from Hextronik. You are now the owner of a professional charger/discharger with battery management and integral balancer.



INTRODUCTION

Please read this entire operating manual completely and attentively before using this product, as it covers a wide range of information on operating and safety. Or please do use this product in company with a specialist!

This unit is simple to use, but the operation of a sophisticated automatic charger/discharger such as the Turnigy Mega 1000W does require some knowledge on the part of the user. These operating instructions are designed to ensure that you quickly become familiar with its functions.

It is therefore important that you read right through the Instruction Manual, Warning and Safety Notes before you attempt to use your new automatic charger for the first time. We hope you have many years of pleasure and success with your new battery charger.

Turnigy Mega 1000W employs the circuit that features output power of 1000 watts. It can charge or discharge up 20 cells of NiCd/NiMH or 8 series of Lithium batteries with maximum current of 40A. Turnigy Mega 1000W has an individual cell voltage balancer, so it does not required any balancer separately when charging Lithium batteries (LiPo/LiIon/LiFe) for voltage balancing.

More reliable/durable membrane button systems are using for charger controls. The fan cooling system is so smart and efficiently. The fan speed is controlled by internal temperature sensor.

Please BE SURE to read these instructions and Warning and Safety Notes before you use the charger for the first time.
It can be dangerous to mishandle batteries and battery chargers, as there is always a risk of batteries catching fire and exploding.

Special features

Optimized operating software

Turnigy Mega 1000W features the so-called AUTO function that set the feeding current during the process of charging or discharging. Especially for Lithium batteries, it can prevent the overcharging which may lead to an explosion due to the user's fault. It can disconnect the circuit automatically and alarm once detecting any malfunction. All the programs of this product were controlled through two way linkage and communication, to achieve the maximum safety and minimize the trouble. All the settings can be configured by users!

Internal independent lithium battery balancer

Turnigy Mega 1000W employs an individual-cell-voltage balancer. It isn't necessary to connect an external balancer for balance charging.

Balancing individual cells battery discharging

During the process of discharging, Turnigy Mega 1000W can monitor and balance each cell of the battery individually. Error message will be indicated and the process will be ended automatically if the voltage of any single one cell is abnormal.

Adaptable to various type of lithium battery

Turnigy Mega 1000W is adaptable to various types of lithium batteries, such as Li-Ion, LiPo and the new LiFe series of batteries.

Fast and storage mode of lithium battery

Purposes to charge Lithium battery varies, fast charge reduce the duration of charging, whereas store state can control the final voltage of your battery, so as to store for a long time and protect useful time of the battery.

Maximum safety

Delta-peak sensitivity: The automatic charge termination program based on the principle of the Delta-peak voltage detection. When the battery's voltage exceeds the threshold, the process will be terminated automatically.

Automatic charging current limit

You can set up the upper limit of the charging current when charging your NiCd or NiMH battery; it is useful for the NiMH battery of low impedance and capacity in the 'AUTO' charging mode.

Capacity limit

The charging capacity is always calculated as the charging current multiplied by time. If the charging capacity exceeds the limit, the process will be terminated automatically when you set the maximum value.

SPECIAL FEATURES

Temperature threshold
The batteries internal chemical reaction will cause the temperature of the battery to rise. If the temperature limit is reached, the process will be terminated. This function is available by connecting temperature probe, which is included in the package.

Processing time limit:
You can also limit the maximum process time to avoid any possible defect.

Data store/load
For user's convenience, it can store maximum 10 data of different batteries. You can establish the data contains program setting of the battery to charge or discharge. These data can be called back at any time you need and the process can be executed without program setting.

Cyclic charging/discharging
1 to 5 cyclic and continuous process of charge>discharge or discharge>charge is operable for battery refreshing and balancing to stimulate the batteries activity.

Terminal voltage control(TVC)
The charger allows user to change the end voltage.

Lipo battery meter
The user can check battery's total voltage, the highest voltage, the lowest voltage and each cell's voltage.

These warnings and safety notes are particularly important. Please follow the instructions for maximum safety; otherwise the charger and the battery can be damaged or at worst it can cause a fire.

- Never leave the charger unattended when it is connected to its power supply. If any malfunction is found, TERMINATE THE PROCESS AT ONCE and refer to the operation manual.
- Keep the charger well away from dust, damp, rain, heat, direct sunshine and vibration. Never drop it.
- The allowable input voltage is 11~30V DC
- This charger and the battery should be put on a heat-resistant, noninflammable and nonconductive surface. Never place them on a car seat, carpet or similar. Keep all the inflammable volatile materials away from operating area.
- Make sure you know the specifications of the battery to be charged or discharged to ensure it meets the requirements of this charger. If the program is set up incorrectly, the battery and charger may be damaged .It can cause fire or explosion due to overcharging. This warranty is not valid for any damage or subsequent damage arising as a result of a misuse or failure to observe the procedures outlined in this manual.

Standard Battery Parameters

	LiPo	LiIon	LiFe	NiCd	MiMH	Pb
Nominal Voltage	3.7V/cell	3.6V/cell	3.3V/cell	1.2V/cell	1.2V/cell	2.0V/cell
Max Charge Voltage	4.2V/cell	4.1V/cell	3.6V/cell	1.5V/cell	1.5V/cell	2.46V/cell
Storage Voltage	3.8V/cell	3.7V/cell	3.3V/cell	n/a	n/a	n/a
Allowable Fast Charge	≦1C	≦1C	≦4C	1C-2C	1C-2C	≦0.4C
Min. Discharge Voltage	3.0-3.3V/cell	2.9-3.2V/cell	2.6-2.9V/cell	0.1-1.1V/cell	0.1-1.1V/cell	1.8V/cell

Be very careful to choose the correct voltage for different types of battery otherwise you may cause damage to the batteries. Incorrect settings could cause the cells to fire or explode.

Never attempt to charge or discharge the following types of batteries.

A battery pack which consists of different types of cells (including different manufacturers)
A battery that is already fully charged or just slightly discharged.
Non-rechargeable batteries (Explosion hazard).
Batteries that require a different charge technique from NiCd, NiMh, LiPo or Gel cell (Pb, Lead acid).
A faulty or damaged battery.
A battery fitted with an integral charge circuit or a protection circuit.
Batteries installed in a device or which are electrically linked to other components.
Batteries that are not expressly stated by the manufacturer to be suitable for the currents the charger delivers during the charge process.

Please bear in mind the following points before commencing charging:

Did you select the appropriate program suitable for the type of battery you are charging?
Did you set up adequate current for charging or discharging?
Have you checked the battery voltage? Lithium battery packs can be wired in parallel and in series, i.e. a 2 cell pack can be 3.7V (in parallel) or 7.4V (in series).
Have you checked that all connections are firm and secure?
Make sure there are no intermittent contacts at any point in the circuit.

Charging

During charge process, a specific quantity of electrical energy is fed into the battery. The charge quantity is calculated by multiplying charge current by charge time. The maximum permissible charge current varies depending on the battery type or its performance, and can be found in the information by the battery manufacturer. Only batteries that are expressly stated to be capable of quick-charge are allowed to be charged at rates higher than the standard charge current.

Connect the battery to the terminal of the charger: red is positive and black is negative. Due to the difference between resistance of cable and connector, the charger can not detect resistance of the battery pack, the essential requirement for the charger to work properly is that the charge lead should be of adequate conductor cross-section, and high quality connectors which are normally gold-plated should be fitted to both ends.

Always refer to the manual by the battery manufacturer pertaining to charging methods, recommended charging current and charging time. Especially, the Lithium battery should be charged according the charging instruction provided by the manufacturer strictly.

Attention should be paid to the connection of Lithium battery especially.

Do not attempt to disassemble the battery pack arbitrarily.

Please get highlighted that Lithium battery packs can be wired in parallel and in series. In the parallel connection, the battery s capacity is calculated by multiplying single battery capacity by the number of cells with total voltage stay the same. The voltage s imbalance may cause fire or explosion .Lithium battery is recommended to charge in series.

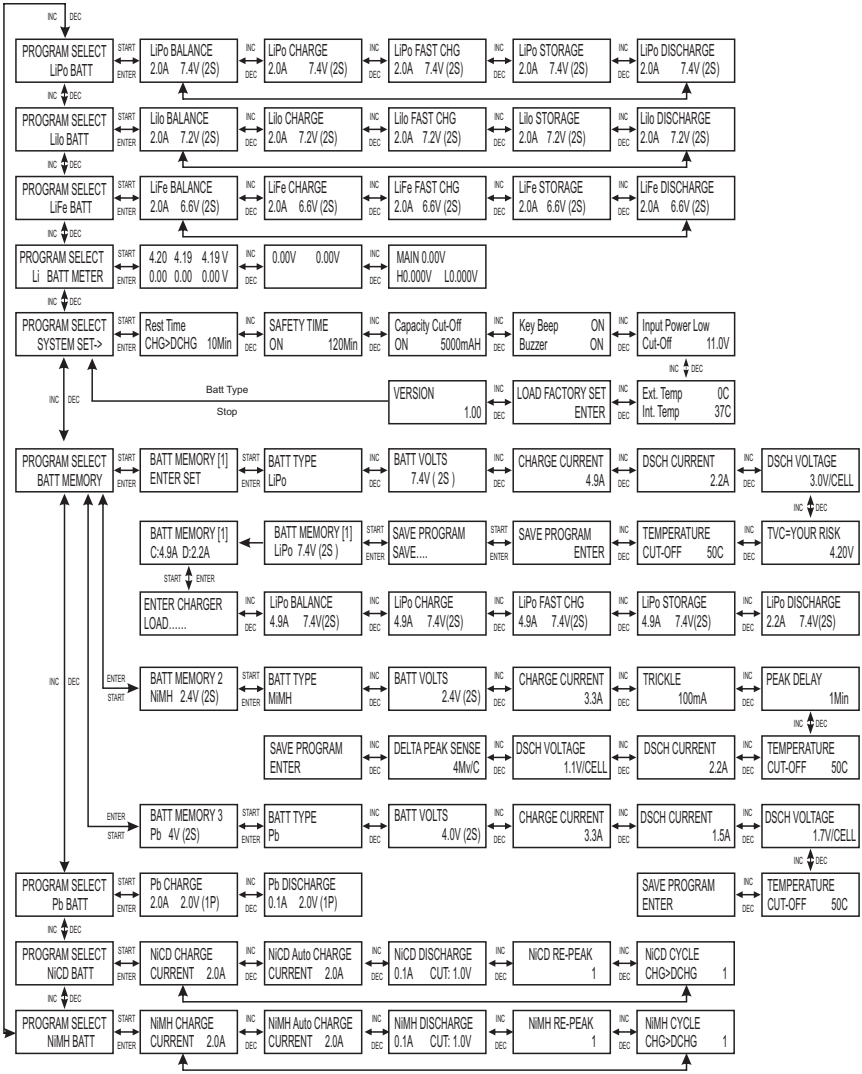
Discharging

The main purpose of discharging is to clean residual capacity of the battery, or to reduce the battery voltage to a defined level. The same attention should be paid to the discharging process as charging. The final discharge voltage should be set up correctly to avoid deep-discharging. Lithium battery can not be discharged to lower than the minimum voltage, or it will cause a rapid loss of capacity or a total failure. Generally, Lithium battery doesn' t need to be discharged. Please pay attention to the minimum voltage of Lithium battery to protect the battery.

Some rechargeable batteries have a memory effect. If they are partly used and recharged before the whole charge is accomplished, they remember this and will only use that part of their capacity next time. This is a memory effect It is said that NiCd and NiMH batteries are suffering from memory effect. NiCd has more memory effect than NiMH.

Lithium batteries are recommended to be discharged partially rather than fully discharged. Frequent full discharging should be avoided if possible. Instead, charge the battery more often or use a battery of larger capacity. Full capacity cannot be reached until it has been subjected to 10 or more charge cycles. The cyclic process of charge and discharge will optimize the capacity of battery pack.

PROGRAM FLOW CHART



CONNECTING THE CHARGER

Turnigy Mega 1000W comes with male 4mm Bullet connectors attached to the power INPUT cables. These cables are appropriate for attaching directly to most high-quality AC-DC power supply units, such as TURNIGY 1200W Power supply:Part No.22820(100-120V AC) or Part No.22821(200-240V AC).

4mm Bullet Connectors plugging to TURNIGY power supply directly

Important Notice

To take advantage of Turnigy Mega 1000W's full power capability, the power source should be 11V-30V DC, and output power should be capable of 1200W or higher.
Low quality DC power source may damage your Turnigy Mega 1000W charger. We recommend you to choose TURNIGY 1200W Power Supply.

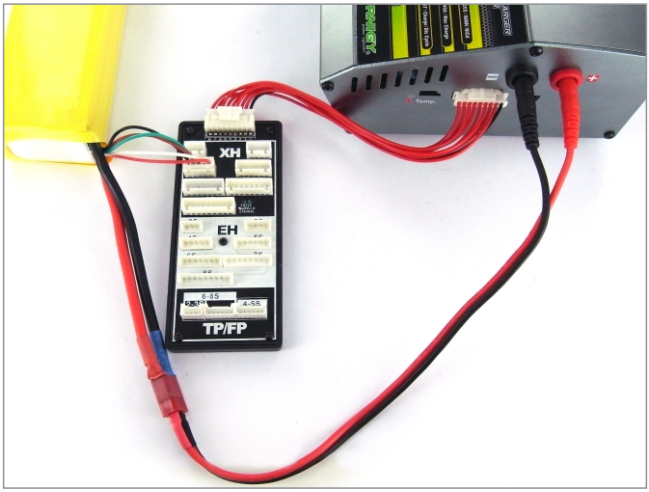
Part No. 22820(100V-120V AC)
Part No. 22821(200V-240V AC)

CONNECTING THE BATTERY

Important !!! Before connecting a battery it is absolutely essential to check one last time that you have set the parameters correctly. If the settings are incorrect, the battery may be damaged, and could even burst into flames or explode. To avoid short-circuits between the banana plugs, always connect the charge leads to the charger first, and only then to the battery. Reverse the sequence when disconnecting the pack.

Balance socket:
The balance wire attached to the battery must be connected to the charger balancing port. Take care to maintain correct polarity!
(Wiring diagram: see below.)

This diagram shows the correct way to connect your battery to the Turnigy Mega 1000W while charging in the balance charge program mode only.



⚠ WARNING:

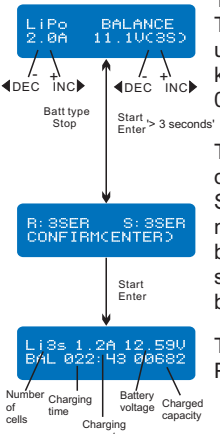
Failure to connect as shown in this diagram will damage this charger.

To avoid short circuit between the charge lead always connect the charge cable to the charger first, then connect the battery. Reverse the sequence when disconnecting.

These programs are only suitable for charging and discharging Lithium batteries with a nominal voltage of 3.3V, 3.6V and 3.7V per cell. These batteries need to adopt different charge technique is termed a constant voltage(CV) and constant current(CC) method. The charge current varies according to the battery capacity and performance. The final voltage of charge process is also very important; it should be precisely matched with the charade voltage of the battery. They are 4.2V for LiPo, 4.1V for Lilo, and 3.6 V for LiFe. The charge current and nominal voltage as for cell count set on the charge program must always be correct for the battery to be charged.
When you are willing to alter the parameter value in the program, press Start/Enter key to make it blink then change the value with INC or DEC key. The value will be stored by pressing Start/Enter key once.

Charging Lithium battery at balance mode

This function is for balancing the voltage of Lithium-polymer battery cells while charging.
In the balance mode, the battery needs to have a balance lead to connect to the battery's power lead to the output of charger.
In this mode, the charging process will be different from ordinary charging mode. The internal processor of the charger will monitor the voltages of each cell of the battery pack and controls charging current that is feeding to each cell to normalise the voltage.
Note: We recommends charging lithium batteries with a balance lead in the balance mode only.



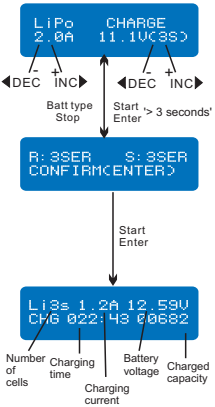
The left side of the first line shows the type of battery you choose. The value on the left of the second line of the charger is current user set. After setting the current and voltage, press Start/Enter key for more than 3 seconds to start the process.(charge current: 0.1-40.0A, voltage: 2S-8S).

This displays the number of cells you set up and the processor detects. R shows the number of cells detected by the charger and S is the number of cells set by you at the previous screen. If both numbers are identical you can start charging by press Start/Enter button. If not, press Batt Type/Stop button to go back to previous screen to carefully check the number of cells of the battery pack before going ahead.

This screen shows the real-time status during charge process. Press Batt Type/Stop key once to stop the charge process.

Charging of Lithium Battery

This charging mode is for charging Li-Po/Ion/Fe battery without balance lead.
Note: We recommends charging lithium batteries with a balance lead in the balance mode only.



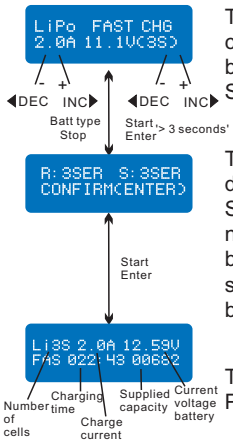
The left side of the first line shows the type of battery you choose. The value on the left of the second line of the charger is current user set. After setting the current and voltage, press Start/Enter key for more than 3 seconds to start the process.(charge current: 0.1-40.0A, voltage: 1S-8S).

This displays the number of cells you set up and the processor detects. R shows the number of cells detected by the charger and S is the number of cells set by you at the previous screen. If both numbers are identical you can start charging by press Start/Enter button. If not, press Batt Type/Stop button to go back to previous screen to carefully check the number of cells of the battery pack before going ahead.

This screen shows the real-time status during charge process. Press Batt Type/Stop key once to stop the charge process.

'FAST' charging of Lithium battery

The charging current is getting smaller as the process goes to the near end term of Lithium battery charging. To finish charging process earlier, this program eliminate certain term of CV process. Actually, the charging current will goes to 1/5 from the initial value to end the process while the normal charging goes to 1/10 during CV term. The charging capacity may be a bit smaller than normal charging but the process time will be reduced.



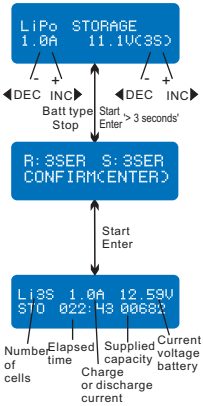
The value on the left side of the second lines sets the charge current. The value on the right side of the second lines sets the battery pack's voltage. After setting current and voltage, press Star/Enter for more than 3 seconds to start the process.

This displays the number of cells you set up and the processor detects. R shows the number of cells detected by the charger and S is the number of cells set by you at the previous screen. If both numbers are identical you can start charging by press Start/Enter button. If not, press Batt Type/Stop button to go back to previous screen to carefully check the number of cells of the battery pack before going ahead.

This screen shows the real-time status during charge process. Press Batt Type/Stop key once to stop the charge process.

'STORAGE' control of lithium battery

This is for charging or discharging Lithium battery not to be used for the time being. The program will determine to charge or discharge the battery to the certain voltage depending on the voltage of the battery at its initial stage. They are different from the type of the battery, 3.75V for LiIo, 3.85V for LiPo and 3.3V for LiFe per cell. If the voltage of battery at its initial stage is over the voltage level to storage, the program will start to discharge.

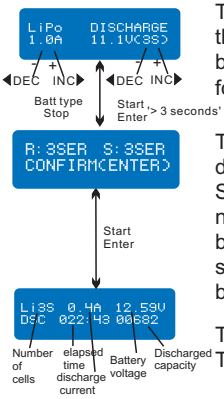


At this screen, you can set up the current and voltage of the battery pack. Charging and discharging will make the batteries come to the voltage level of storage state.

This displays the number of cells you set up and the processor detects. R shows the number of cells detected by the charger and S is the number of cells set by you at the previous screen. If both numbers are identical you can start charging by press Start/Enter button. If not, press Batt Type/Stop button to go back to previous screen to carefully check the number of cells of the battery pack before going ahead.

This screen shows the real-time status charging. Press Batt Type/Stop key once to stop the charge process.

Discharging Lithium battery



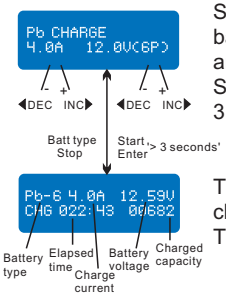
The value of discharge current on the left can not exceed 1C, and the value on the right can not be under the voltage recommended by the manufacturer to avoid deep discharging. Press Start/Enter for more than 3 seconds to start discharging.

This displays the number of cells you set up and the processor detects. R shows the number of cells detected by the charger and S is the number of cells set by you at the previous screen. If both numbers are identical you can start charging by press Start/Enter button. If not, press Batt Type/Stop button to go back to previous screen to carefully check the number of cells of the battery pack before going ahead.

This shows the real-time status of discharging, you can press Batt Type/Stop key to stop discharging.

This is programmed for charging Pb(lead-sulphuric acid) battery with nominal voltage from 2 to 32V. Pb batteries are totally different from NiCd or NiMH batteries. They can only deliver relatievely lower current compare to their capacity, and similar restrictions definitely apply to charge. So the optimal charge current will be 1/10 of the capacity. Pb batteries must not be charged rapidly. Always follow the instruction is supplied by the manufacturer of battery.
When you are willing to alter the parameter value in the program, press Start/Enter key to make it blink then change the value with INC or DEC key. The value will be stored by pressing Start/Enter key once.

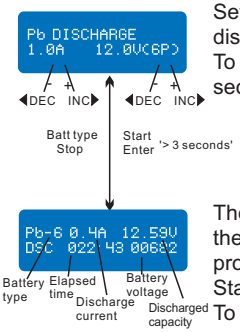
Charging of Pb battery



Set up the charge current on the left and the nominal voltage of the battery on the right. The charge current ranges from 0.1 to 40.0A and the voltage should be matched with the battery being charged. Start the charge process by pressing Start/Enter key for more than 3 seconds.

The screen displays the state of charging process. To stop charging forcibly, press Batt type/Stop key once.
The audible sound indicates you at the end of process.

Discharging of Pb battery



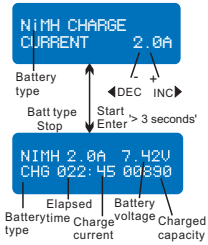
Set discharge current on the left and final voltage on the right. The discharge current ranges from 0.1 to 8.0A.
To start the process, press Start/Enter key for more than 3 seconds.

The screen displays the current state of discharge. You can alter the discharge current by pressing Start/Enter key during the process. Once you change the current value, store it by pressing Start/Enter button again.
To stop discharging press Batt Type/Stop key once. The audible sound indicates you at the end of process.

These programs are for charging or discharging NiMH (Nickel-Metal-Hydride) or NiCd (Nickel-Cadmium) battery commonly used for R/C model aplications. To alter the value at the display, press Start/Enter key to make it blink then change the value using INC or DEC key. The value will be stored by pressing Start/Enter key once.
To start the process, press Start/ Enter button for more than 3 seconds.

Charging of NiCd/NiMH battery

The charger will charge NiCd and NiMh batteries using the charge current set by the user.

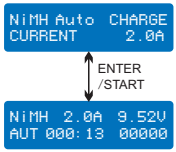


This program is for charging of NiCd/NiMH batteries associated with R/C models applications. You can press Start/Enter key to make it blink and then Inc or Dec to change the parameter value. Press START/ENTER key to store the value.

The screen displays the current state of charging.
To stop the process, press Batt type/Stop key once.
The audible sound indicates you the end of process.

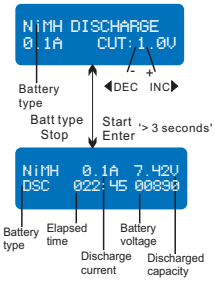
Charging NiCd/NiMH battery in the AUTO charge mode

In this program the charger detects the condition of the battery which is connected to the output and automatically charges the battery. In this mode, you should set up the upper limit of the charge current to avoid damage by excessive feeding current. Some batteries of low resistance and capacity can lead to higher current in the auto charging mode.



This program is for charging of NiCd/NiMH batteries. You can press the Start/Enter button to make it blink and then press the Dec/Inc button to change the parameter value. Press the Start/Enter button more than 3 seconds to start the charging process.

Discharging of NiCd/NiMH battery

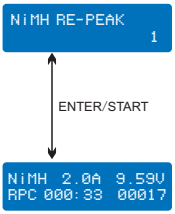


Set discharge current on the left and final voltage on the right. The discharge current ranges from 0.1 to 8.0A and the final voltage ranges from 0.1 to 32.0V). To start the process, press Start /Enter key more than 3 seconds.

The screen indicates the discharging state. You can press Start/Enter key to alter discharge current. Press Start/Enter again to store the value. Press Batt Type/Stop key to stop discharging. The emitted sound alerts the end of discharging.

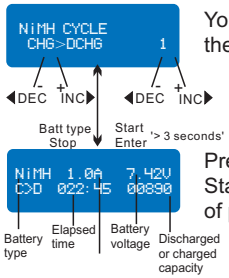
Charging NiCd/NiMH battery in re-peak charge mode

Re-peak Charge Mode (NiCd and NiMH batteries only): In re-peak charge mode, the charger can peak charge the battery once, twice or three times in a row automatically. This is good for confirming the battery is fully charged, and for checking how well the battery receives fast charges. A five minute cool-off delay occurs after each re-peak charge. See the diagram below for using re-peak charge mode. To start charging, press the Start/Enter button for 3 seconds.



“Re-peak cycle: 1” shows on the display. Press the Start/Enter button to make the re-peak cycle number blink and press the Dec/Inc button to find the desired number of times to re-peak. Press the Start/Enter button to confirm selection.

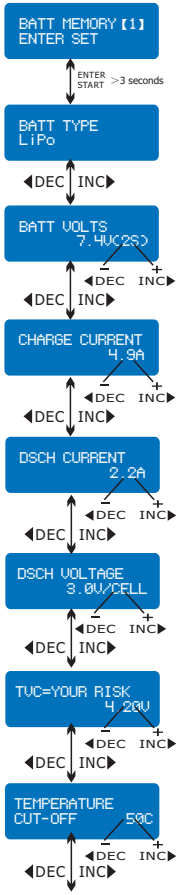
Charge/discharge & discharge/charge cycle of NiMH/NiCd battery



You can set up sequence on the left and the number of cycles on the right. Range of the cycle number is 1-5.

Press Batt Type/Stop key to stop program, you can press Start/Enter key to alter charge current. The sound indicates the end of program.

The charger can store up to 10 different charge/discharge profiles for your convenience, and the stored profiles can be recalled quickly without having to go through the setup process.



Enter the battery memory program, you can change the battery type(Lipo, Lilo, LiFe, NiMH, NiCd, Pb battery), voltage, charge current by pressing the Start/Enter button to make the value blink, the INC or DEC buttons to change the value, and Start/Enter button once more to store the value and move to the next value or screen. (Note: The battery used for this example is a 2S(7.4V) Lipo battery.

Set the voltage and number of cells, along with the normal voltage (1-8S).

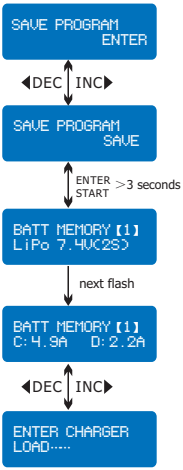
Set the charge current, which can be adjusted(0.1-40.0A).

Set the discharge current, which can be adjusted(0.1A-8.0A, each port).

Set the discharge voltage, which can be adjusted(3.0V/CELL-3.3V/CELL).

Set the terminal voltage, which can be adjusted(4.18v-4.30v).

Set the cut-off temperature, which can be adjusted(20C-80C).

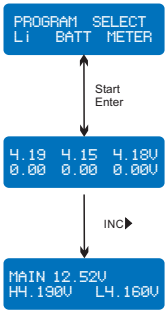


Save the program set by pressing the Start/Enter button for more than three seconds.

This screen indicate the saved profile.

Once you've saved a charge profile, you can load those settings to use later. To load a memory, you have to press the Start/Enter Button for more than 3 seconds. Otherwise you only enter the setting mode.

This screen indicates that the charge profile is being loaded.

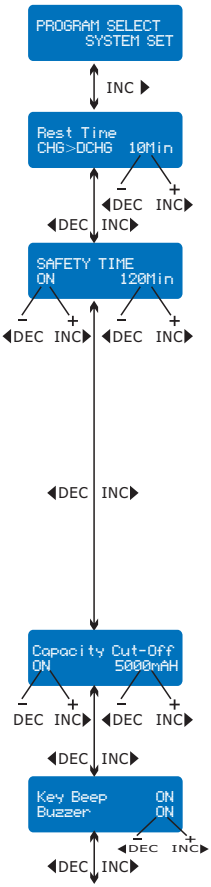


Press the Start/Enter button to enter the Lithium Battery Meter.

The screen indicate each cell's voltage.

The screen indicate the total voltage, the highest voltage, the lowest voltage.

It will be operated with the default value of the essential user settings when it is connected to a DC 11~30V batttery for the first time.The screen displays the following information in sequence and the user can change the value of parameter on each screen. When you are willing to alter the parameter value in the program, press Start/Enter key to make it blink then change the value with INC or DEC key. The value will be stored by pressing Start/Enter key once.



User set up starting screen.

The battery is on the cyclic process of charge and discharge can often become warm after charge or discharge period. The program can insert a time delay to occur after each charge and discharge process to allow the battery adequate time to cool down before being subjected to the next process. The value ranges from 1 to 60 minutes.

When you start a charge process, the integral safety timer automatically starts running at the same time. This is programmed to prevent overcharge the battery if it proves to be faulty, or if the termination circuit cannot detect the battery full. The value for the safety timer should be generous enough to allow a full charge of the battery.

Safe timer Calculation

When charging NiCd or NiMH batteries, divide the capacity by current, then divide the result by 11.9, set this number as the value for safety timer setting. If the charger stopped at this threshold, about 140% of the capacity will have been fed into the battery.

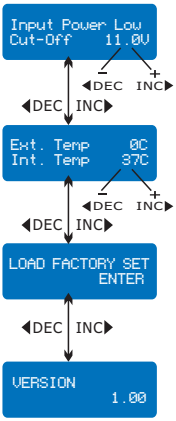
For example:

Capacity	Current	Safety Time
2000mAh	2.0A	(2000/2.0=1000)/11.9=84 minutes
3300mAh	3.0A	(3300/3.0=1100)/11.9=92 minutes
1000mAh	1.2A	(1000/1.2=833)/11.9=70 minutes

This program sets the maximum charge capacity that will be supplied to the battery during charge. If the deltapack voltage is not detected nor the safety timer expired by any reason, this feature will automatically stop the process at the selected capacity value.

The beep sounds at every time pressing the buttons to confirm your action. The beep or melody sounded at various times during operation to alert different mode changes.

These audible sounds can be on or off.



This program monitors the voltage of input battery. If the voltage drops below the value you set the operation forcibly terminated to protect the input battery.

This screen shows the external and internal temperature.

Press and hold the Start/Enter button for more than three seconds to load the factory set.

This screen shows the version.

VARIOUS INFORMATION DURING THE PROCESS

You can inquire various information on LCD screen during charging or discharging process. When you press DEC button the charger shows the establishment of user settings.
And also you can monitor the voltage of individual cell by pressing INC button when the individual connection cable is linked to the Lithium battery being processed.

It comes to the final voltage when the program ended.

Present input voltage.

This screen shows the external and internal temperature.

Displayed safety timer is turn on and duration of time in minutes.

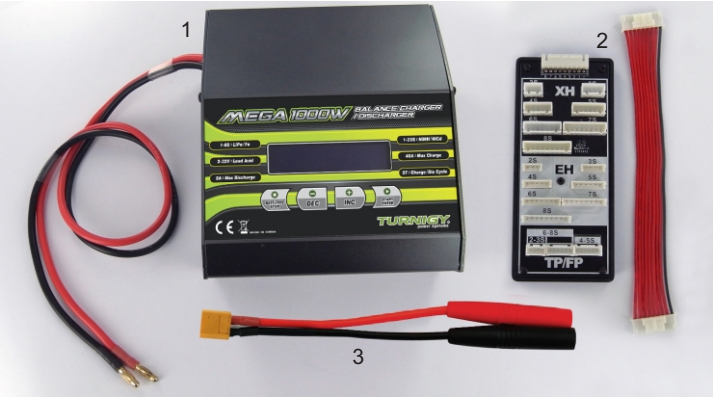
Displayed capacity cut-off function is turn on and the setting value of capacity.

The battery is connected with balance lead, you can check voltage of each cell in the battery pack.

It incorporates a variety of functions for the systems to verify processes and the state of the electronics. In case of an error the screen will display the cause of error and emit an audible sound.

REVERSE POLARITY	Incorrect polarity connected.
CONNECTION BREAK	The battery is interrupted.
CONNECT error Check Main Port	The Battery connection is wrong.
BALANCE CONNECT ERROR	The balance connect is wrong.
DC in too low	Input voltage less than 11V.
DC in too high	Input voltage higher than 30V.
CELL error Low Voltage	Voltage of one cell in the battery pack is too low.
CELL error High Voltage	Voltage of one cell in the battery pack is too high.
CELL error Voltage-Invalid	Voltage of one cell in the battery pack is invalid.
CELL number Incorrect	The cell number is wrong.
Int.temp.too hi	The internal temperature of the unit goes too high.
Ext.temp.too hi	The external temperature of the unit goes too high.
Over charge Capacity Limit	The battery capacity is more than the maximum capacity which the user sets.
Over TIME LIMIT	The charging time is longer than the maximum charging time which the user sets.
BATTERY WAS FULL	The battery voltage is higher than the maximum voltage which the user sets when charging in balance mode.

Set contents



1. Turnigy Mega 1000W Charger
2. 2-8S Mutil Balance Board Adaptor
3. DC Charging Cable with XT60 Male Connector and Banana Connector

Specification

Operating voltage range	DC 11.0~30.0 Volt
Circuit power	Max. Charge power 1000Watts Max. Discharge power 40Watts
Charge current range	0.1~40.0A
Discharge current range	0.1~8.0A
Current drain for balancing Li-Po/Ion/Fe	200mA/cell
Li-ion/Fe/Polymer cell count	1~8cells
NiCd/NiMH battery cell count	1~20cells
Pb battery voltage	2V~32V
Net weight	1360g
Dimension	135x155x82mm

Maximum circuit power chart (Output 1 & 2)

The actual amount of charge current feeding to the battery is automatically be limited to 400 Watts each, so not to exceed the charger's maximum rated charging power. The maximum discharge power is approximately 25 Watts. The discharge current delivered to the charger is limited by charger's internal thermal sensor for maximum discharge current. If the internal temperature over 80 Celsius, the charger will be cut off and "TEMP OVER ERR" will show on the LCD. In this case, please decrease discharging current. Please refer following chart for maximum charging/discharging current.

Maximum Circuit Power Chart (Per Output)

Battery Type	No. of Cells	Rated Voltage(V)	Max Charge Voltage(V)	Charge Current (A) Charging Power 400W	Discharge Current (A) Discharging Power 25W
LiPo	1S	3.7	4.2	20.0	5.0
	2S	7.4	8.4	20.0	3.0
	3S	11.1	12.6	20.0	2.0
	4S	14.8	16.8	20.0	1.5
	5S	18.5	21.0	19.0	1.2
	6S	22.2	25.2	16.0	1.0
Lilon	1S	3.6	4.1	20.0	5.0
	2S	7.2	8.2	20.0	3.0
	3S	10.8	12.3	20.0	2.0
	4S	14.4	16.4	20.0	1.5
	5S	18.0	20.5	19.0	1.2
	6S	21.6	24.6	16.0	1.0
LiFe	1S	3.3	3.6	20.0	5.0
	2S	6.6	7.2	20.0	3.5
	3S	9.9	10.8	20.0	2.3
	4S	13.2	14.4	20.0	1.7
	5S	16.5	18.0	20.0	1.4
	6S	19.8	21.6	18.0	1.2
NiCd/NiMH	2	2.4	3.0	20.0	5.0
	3	3.6	4.5	20.0	5.0
	4	4.8	6.0	20.0	4.2
	5	6.0	7.5	20.0	3.3
	6	7.2	9.0	20.0	2.8
	7	8.4	10.5	20.0	2.4
	8	9.6	12.0	20.0	2.1
	9	10.8	13.5	20.0	1.9
	10	12.0	15.0	20.0	1.7
	11	13.2	16.5	20.0	1.5
	12	14.4	18.0	20.0	1.4
	13	15.6	19.5	20.0	1.3
	14	16.8	21.0	19.0	1.2
	15	18.0	22.5	18.0	1.1

Battery Type	No. of Cells	Rated Voltage(V)	Max Charge Voltage(V)	Charge Current (A) Charging Power 400W	Discharge Current (A) Discharging Power 25W
Pb		6.0	7.4	20.0	3.4
		8.0	9.8	20.0	2.5
		10.0	12.3	20.0	2.0
		12.0	14.8	20.0	1.7
		14.0	17.2	20.0	1.5
		16.0	19.7	20.0	1.3
		18.0	22.1	18.0	1.1
		20.0	24.6	16.0	1.0

Commonly used terms

Final charge voltage: the voltage at which the battery's charge limit (capacity limit) is reached. The charge process switches from a high current to a low maintenance rate (trickle charge) at this point. From this point on further high current charging would cause overheating and eventual terminal damage to the pack.

Final discharge voltage: the voltage at which the battery's discharge limit is reached. The chemical composition of the batteries determines the level of this voltage. Below this voltage the battery enters the deep discharge zone. Individual cells within the pack may become reverse polarized in this condition, and this can cause permanent damage.

A, mA: unit of measurement relating to charge or discharge current.1000 mA = 1 A (A=Ampere,mA=Milliampere)

Ah, mAh: unit of measurement for the capacity of a battery (Amperes x time unit; h = hour). If a pack is charged for one hour at a current of 2 A, it has been fed 2 Ah of energy. It receives the same quantity of charge (2 Ah) if it is charged for 4 hours at 0.5 A, or 15 minutes (=1/4 h) at 8 A.

'C'-rating: Capacity is also referred to as the 'C' rating. Some battery suppliers recommend charge and discharge currents based on the battery 'C' rating. A battery's '1C' current is the same number as the battery's rated capacity number, but noted in mA or amps. A 600mAh battery has a 1C current value of 600mA, and a 3C current value of (3 x 600mA) 1800mA or 1.8A. The 1C current value for a 3200mAh battery would be 3200mA (3.2A).

Nominal voltage(V): The nominal voltage of the battery pack can be determined as follows;
-.NiCd or NiMH: multiply the total number of cells in the pack by 1.2. A 8-cell pack will have a nominal voltage of 9.6 volts (8x1.2).
-.LiPo: multiply the total number of cells in the pack by 3.7. A 3-cell LiPo wired in series will have a nominal voltage of 11.1 volts (3x3.7).
-.LiIo: multiply the total number of cells in the pack by 3.6. A 2-cell LiIo wired in series will have a nominal voltage of 7.2 volts (2x3.6).
-.LiFe: multiply the total number of cells in the pack by 3.3. A 4-cell LiIo wired in series will have a nominal voltage of 13.2 volts (4x3.3).
If the nominal voltage of the battery is not printed on the battery's label, consult your battery manufacturer or supplier. Do not guess the rated voltage of battery.

Liability exclusion

This charger is designed and approved exclusively for use with the types of battery stated in this Instruction Manual. Hextronik accepts no liability of any kind if the charger is used for any purpose other than that stated.
We are unable to ensure that you follow the instructions supplied with the charger, and we have no control over the methods you employ for using, operating and maintaining the device. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect use and operation of our products, or which are connected with such operation in any way.Unless otherwise prescribed by law, our obligation to pay compensation, regardless of the legal argument employed, is limited to the invoice value of those Hextronik products which were immediately and directly involved in the event in which the damage occurred.

Warranty and service

We guarantee this product to be free of manufacturing and assembly defects for a period of one year from the time of purchase. The warranty only applies to material or operational defects, which are present at t he time of purchase. During that period, we will repair or replace free of service charge for products deemed defective due to those causes.

You will be required to produce proof of purchase (invoice or receipt). This warranty is not valid for any damage or subsequent damage arising as a result of misuse, modification or as a result of failure to observe the procedures outlined in this manual.